

CLAIMSWhat is claimed is:

1. An ink supply for an inkjet printing system, the ink supply having one or more areas of relatively high air diffusion through one or more structures comprising the ink supply, one or more air diffusion barrier structures shielding each of said one or more areas of relatively high air diffusion from air diffusion, and a quantity of liquid unsaturated ink disposed in said ink supply.

2. The ink supply of claim 1 wherein the ink supply includes a reservoir for holding the quantity of liquid unsaturated ink, a fluid interconnect for interconnecting to the printing system when the ink supply is installed in the printing system, wherein the one or more areas of relatively high air diffusion includes an ink flow path between the reservoir and the fluid interconnect, and wherein the one or more air diffusion barrier structures includes a first barrier structure for shielding the ink flow path from air diffusion from the external environment into the ink flow path.

3. The ink supply of claim 2 wherein the first barrier structure includes a structure enveloping the ink flow path.

4. The ink supply of claim 3, wherein said structure is fabricated from stainless steel, aluminum, ceramic or a high barrier polymer, including Nylon, PET, ABS, PPS or LCP.

5. The ink supply of claim 3 wherein the structure includes an insert disposed in said fluid interconnect.

6. The ink supply of claim 5 wherein the insert is a hollow insert structure disposed in said fluid interconnect.

5 7. The ink supply of claim 2 further comprising a chassis member fabricated of a material having a relatively high air diffusion rate, the chassis member having a fluid passage formed therethrough leading between a fluid interconnect port and an ink reservoir attachment, and wherein the one or more air diffusion barrier structures includes a barrier structure shielding the fluid passage.

8. The ink supply of claim 2 wherein the ink reservoir is a collapsible bag.

9. The ink supply of claim 8 wherein the collapsible bag is a multi-layered structure including a barrier layer providing a high barrier to air diffusion.

10. The ink supply of claim 9 wherein said barrier layer is a metalized layer or a high barrier polymer or a metal oxide deposition layer.

5 11. The ink supply of claim 1 wherein the ink supply includes a reservoir for holding the quantity of liquid unsaturated ink, and a fluid interconnect for interconnecting to the printing system when the ink supply is installed in the printing system, the fluid interconnect including a septum for receiving a needle when the ink supply is installed in the printing system, wherein the one or more areas of relatively high air diffusion include the septum, and wherein the one or more barrier structures includes a
10 septum barrier structure applied to the septum.

12. The ink supply of claim 11 wherein the septum barrier structure includes a metal layer affixed to the septum after the quantity of ink is disposed in said ink supply.

13. The ink supply of claim 12 wherein the metal layer is an adhesive-backed metal tape.

14. The ink supply of claim 12 wherein the metal layer is a layer of aluminum or copper.

15. The ink supply of claim 1 wherein the ink supply includes a reservoir for holding the quantity of liquid unsaturated ink, and a fluid interconnect for interconnecting to the printing system when the ink supply is installed in the printing system, the fluid interconnect including a septum for receiving a needle when the ink supply is installed in the printing system, and wherein the septum is fabricated of an elastomeric material having a high air diffusion barrier property, the septum comprising the one or more barrier structures.

16. The ink supply of claim 15 wherein the elastomeric material is selected from a group including EPDM, Butyl, an EPDM/polypropylene (PP) blend, or a Butyl/PP blend.

17. The ink supply of claim 1, wherein the liquid unsaturated ink has an air solubility level of 70% or less.

18. The ink supply of claim 17, wherein the air diffusion barrier structures are constructed to shield the liquid unsaturated ink from air diffusion so as to provide a shelf life of at least six months, such that the air solubility level does not exceed 70% during the shelf life.

19. The ink supply of claim 18, wherein said shelf life is at least eighteen months.

20. The ink supply of claim 1, wherein the unsaturated ink has an initial saturation level of 20% or less, and wherein the air diffusion barrier structures are constructed to shield the liquid unsaturated ink from air diffusion so as to provide a shelf life of at least six months, such that the air solubility level does not exceed 70% during the shelf life.

21. A replaceable ink supply for an inkjet printing system including an inkjet printhead, the ink supply comprising:

an ink reservoir structure defining an ink reservoir;
a fluid interconnect fluidically coupled to the ink reservoir;

a body of unsaturated ink disposed in said ink reservoir;

the fluid interconnect providing a fluid path for the ink to pass from the reservoir to the printing system when the ink supply is installed in the printing system; and

an air diffusion barrier system protecting the ink reservoir and the fluid interconnect from air diffusion for a shelf life of at least a period of six months, so that ink delivered to the printing system remains in a unsaturated condition for at least said period of six months.

22. The ink supply of claim 21, wherein the unsaturated ink in said reservoir has an air absorption capability after said period of six months, so that said unsaturated ink upon delivery to the inkjet printhead can absorb air within the printhead until an air saturation level in said ink is reached.

23. The ink supply of claim 21, wherein:

the ink reservoir structure includes a collapsible bag and a chassis structure to which the bag is attached;

the fluid interconnect comprises a fluid passageway formed by the chassis leading from the bag to a fluid outlet, and a septum disposed in said passageway at said fluid outlet; and

the air diffusion barrier system includes a first barrier structure for shielding the passageway from air diffusion from the external environment into the ink flow path, and a second barrier structure for shielding the fluid outlet from air diffusion into the ink flow path from the external environment.

24. The ink supply of claim 23, wherein said collapsible bag is fabricated from a metallized layered structure.

25. The ink supply of claim 21, wherein the unsaturated ink has an initial saturation level of 20% or less at commencement of said shelf life, and wherein the air diffusion barrier structures are constructed to shield the liquid unsaturated ink from air diffusion such that the air solubility level does not exceed 70% during the shelf life.

26. The ink supply of claim 25 wherein said shelf life is at least eighteen months.